

ABSTRACT OF THE DISCLOSURE

A dispersion strengthened castable aluminum-rare earth alloy provides high strength at elevated temperatures. In one example, the aluminum alloy includes approximately 1.0 to 20.0% by weight of gadolinium, approximately 0.1 to 10.0% total by weight of other rare earth elements including ytterbium, erbium or yttrium, and approximately 0.1 to 15.0% total by weight of minor alloy elements. In another example, the aluminum alloy includes approximately 1.0 to 20% by weight of ytterbium, approximately 0.1 to 10.0% total by weight of other rare earth elements including gadolinium, erbium or yttrium, and approximately 0.1 to 10.0% total by weight of minor alloy elements. After casting, the aluminum alloy is solidified and cooled. During solidification, the aluminum matrix excludes the rare earth alloy elements from the aluminum matrix, forming eutectic rare earth element-containing dispersoids that strengthen the aluminum matrix.

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